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ABSTRACT

Desktop publishing (DTP) could potentially become a powerful, relatively inexpensive tool for use in university extension activities. This paper describes and explains the characteristics of DTP and examines its effects on university extension. In addition, it outlines the kind of hardware, software, and skills needed and costs; describes new activities and products related to DTP; and examines extension functions likely to be impinged upon by DTP. Because DTP does not require users to embed complicated commands in text to produce certain printing effects, it can be used by individuals who do not have extensive training in word processing or computing. Not all of the effects of DTP are positive, however. DTP brings with it the potential for good-looking, but poor-quality or unnecessary publications. Although visually attractive, justified text can actually impair the legibility of many instructional materials and thereby reduce their effectiveness. On the other hand, the capability of mixing graphics and text easily is likely to be a boon to educators. Word processing, advertising, the publication of bulletins and newsletters, the development and production of distance education print materials, and the printing of signs are among the many university extension functions that will likely be made easier by DTP. Besides empowering university extension, DTP will also challenge administrators and graphic artists to develop and maintain a consistent organizational visual image for their university extension programs. (Appendixes include sample DTP materials and lists and descriptions of additional readings on DTP, DTP software, and typical hardware required for DTP.) (MN)

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Desktop Publishing: Probable Effects on University Extension

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Abstract

The characteristics of desktop publishing (DTP) are described and explained, and its effects on university extension are examined, in language that assumes absolutely no knowledge of either computers or printing processes. The paper describes the characteristics of DTP; outlines the kind of hardware, software, and skills needed (and their costs); describes some new activities and products related to DTP; examines the extension functions that are likely to be impinged upon by DTP, and comments on whether the effects are positive or negative.

Paper presented at the
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Desktop Publishing (DTP), a relatively new phenomenon stemming from the marriage of the technologies of printing and computing, makes available to university extension units a powerful, relatively inexpensive tool. For a number of reasons outlined in this paper, DTP could have pronounced effects on extension activities; most of them will be positive, but there could be a few negative ones, too.

This paper addresses the following questions:

- What is desktop publishing?
- What is WYSIWYG?
- What facilities are required for DTP?
- What are some phenomena related to DTP?
- What extension functions are likely to be affected by DTP?
- Are the effects of DTP positive or negative?

An appendix contains a list of additional readings on DTP, a list of DTP software products and a brief description of what they do, and a list of typical hardware required. Some samples of DTP materials are also appended.

What is desktop publishing?

DTP is the term that has emerged over the last couple of years to describe the use of a microcomputer and a very high quality (laser) printer for the production of printed copy that is "camera-ready", i.e., ready to be sent to the print shop, where it will be either photographed and converted into printing plates or reproduced in some other way. DTP is characterized by:

- multiple columns of text per page, capable of justified right margins;
- ability to produce mirror image pages quickly and easily (e.g., create outside edge margins of a different size than binding margins, and maintain the relationship across even- and odd-numbered pages);
- intermixed graphics and text, with graphics or headline text capable of spanning more than one column of body text. The graphics may be line drawings, graphs, or digitized photographs or organizational logos;
- variety of typefaces available, in different sizes and styles (e.g., **bold**, *italic*, **outline**, <u>underlined</u>, SMALL CAPITALS, etc.);
- lines, rectangles, ovals, or other shapes to frame or separate text or graphic elements;
- areas filled with patterns, possibly with text overlaid;
- ability to rotate text and graphics on a page, or to rotate an entire page;
- high-quality printed output (at minimum, 300 lines per inch vertically and horizontally; up to 2540 lines per inch with some

equipment);

- WYSIWYG ("what you see [on the screen] is what you get") layout:
  - on-screen positioning of elements (text blocks, graphics, headlines, photographs, borders, etc.)
  - "pouring" text into predefined areas, so that when the first designated space is completely filled with text, the excess text "spills over" into a second designated space
  - instantaneous resizing and/or reshaping of text areas or graphics
  - instantaneous changing of font, and style or size of text, for part or all of a text block.

The graphics can take the form of graphs (line, bar, pie, area, etc.); line drawings of various types; or artwork, photographs, or even "live" television images that have been converted to digital form. They may be either object-oriented or bit-mapped graphics[1] produced with a mouse, a graphics tablet, or as already noted, a digitized television signal. A typical DTP program allows the user to block out various areas of an electronic "page", and to subsequently fill the blocked-out areas with text or graphics. It allows the user to "pour" text into spaces of a variety of sizes and shapes, just as one might pour a liquid into containers of a variety of sizes and shapes. Thus once the overall structure of the document is laid out, the text can be fitted into it.

Similarly with graphics: Areas on the page can be left blank to accommodate a particular digitized picture, line drawing, or graph; the page can be arranged into a pleasing format, then the blank areas can be filled in by "pasting in" the appropriate graphics, adjusting their sizes and shapes as necessary to achieve the desired effect.

Of course, both graphics and text can be intermixed on a given page. As adjustments to the page layout are required by the quantity of text and the size and shape of graphics, they can be made dynamically, on the screen.

Horizontal and vertical lines of various thickness and textures can be inserted for emphasis. Text can be enclosed in (i.e., surrounded by) "boxes" of various shapes and textures (patterns, such as cross-hatching, horizontal or vertical "shading", brick, various "shades of grey", etc). The "boxes" themselves can be outlined (either with black or one of the textures), filled with one or more of the textures, or both.

Digitized company or institutional logos can be included as graphic elements.

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[1] These rather technical terms are explained in the Appendix, and are not germane to the understanding of what DTP is.

What is WYSIWYG?

As noted earlier, WYSIWYG stands for "What You See Is What You Get". In earlier computer-aided layout programs (and indeed, in many still in use today, especially on large computers), various commands had to be embedded in the text to produce certain effects. In addition to, memorizing the often-cryptic commands, the computer operator had to use his or her visual imagination in order to estimate the final effect of the commands, resulting in an inordinate amount of trial and error for all but the most expert user.

For example, the sequence shown below, which is mythical, but typical,

```
.CE
.FO=GE
.FS=18
.BO
.IT
A Title is Born
.LM=20
.RM=55
.CE
.FS=12
.NO

In order to create a title over a paragraph, some careful attention to
detail is necessary.  In addition, a person has to have very good ability to
visualize the results.
```

might produce the effect shown below, with such an embedded-command system.

A Title is Born

In order to create a title over a paragraph, some careful attention to detail is necessary. In addition, a person has to have very good ability to visualize the results.

The location of graphic elements might have to be described in terms of coordinates on a page (e.g., number of inches from the page margins to the four points defining the border of the graphic).

WYSIWYG programs do away with those kinds of requirements, and allow you to see on the screen exactly what you will see on the printed page (for example, see Figure 1). In other words, when you give the command to change a segment of text to bold italics, the change is immediately visible. Similarly, the relative placement

of words is obvious: there is no need to guess how many words will fit on a particular line, or what the effect would be of increasing the font size for a particular phrase.

In a DTP program, a whole page is reduced to fit onto a computer screen (see Figure 2), so at times the screen images are so small as to be unreadable. But presumably proofreading for typographical errors will already have taken place, and the focus of attention is on placement on the page of the text and graphic elements. Thus, at this stage, the page designer is only concerned with moving blocks of text, or other elements, such as graphics, into a pleasing and effective arrangement on the page.

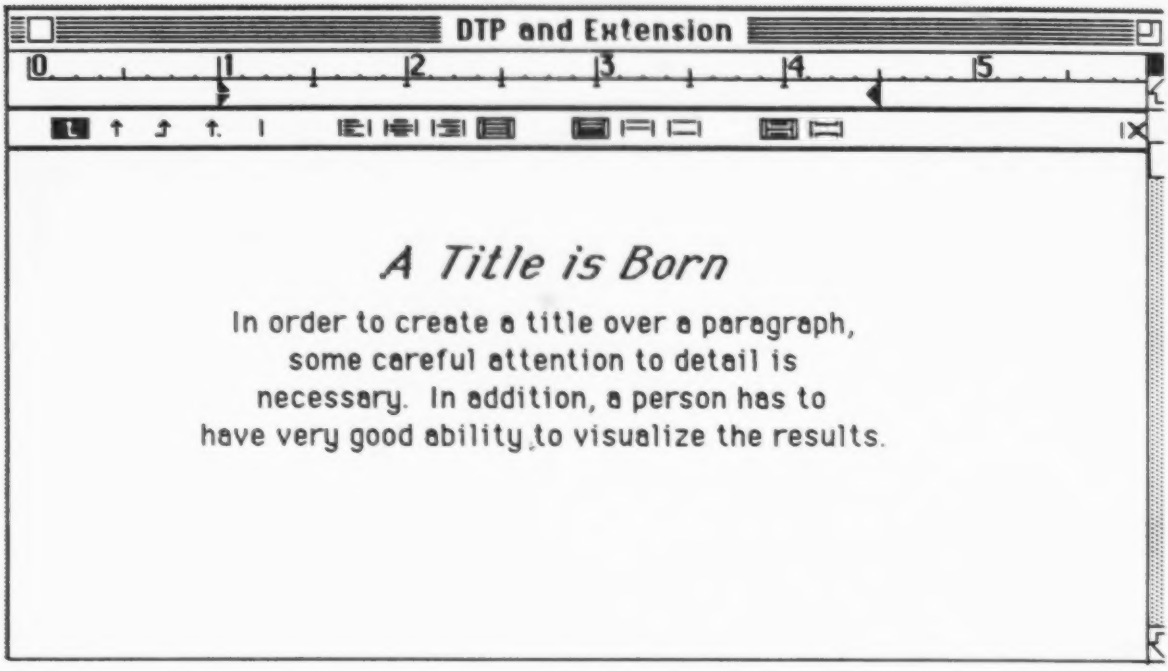
DTP and Extension
A Title is Born
In order to create a title over a paragraph, some careful attention to detail is necessary. In addition, a person has to have very good ability to visualize the results.

FIGURE 1. Actual view of a WYSIWYG computer screen.

What facilities are required for DTP?

The concept of DTP emerged with the availability of the Apple Macintosh computer and the Apple LaserWriter printer. The first software to do DTP—PageMaker—was produced by Aldus Corporation, and a couple of programs from competing firms quickly followed.

The rapidly-expanding market for the high-quality results of DTP has led to the recent availability of PageMaker for PC-DOS (IBM-compatible) machines, and others will likely follow suit shortly.

At the same time, laser printers capable

of doing DTP[2] are also becoming available from other firms (e.g., Digital Equipment Canada– DEC, Hewlitt-Packard), in order to capitalize on that market segment that is already committed to PC-DOS equipment. These laser printers, like the Apple LaserWriter, are capable of printing images with 300 dots per inch resolution.[3]

While this degree of resolution is not sufficient to satisfy many printing applications (e.g., magazines and most commercial printing requirements are for a minimum of about 700 dots per inch or more), it will easily satisfy most university extension printing requirements. For one thing, the resolution of standard xerographic machines is also 300 dots per inch, so if material is going to be reproduced xerographically, any higher resolution on the original is effectively wasted. Also, there are other (very expensive– $30,000 - $60,000 U.S.) printing devices available that will produce approximately 2540 dots per inch resolution from the same computer/software combinations. Additionally, certain tricks can be used to circumvent the limitation: The copy can be produced at twice normal size, then reduced photographically as part of the printing plate-making process (at no extra cost), effectively giving double the resolution. (Indeed, that is exactly the process that is currently used to produce the *CAUCE Journal*.)

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2 The principal requirement is that the laser printer support the PostScript language.

3 The more dots (or lines) per inch of resolution, the better-looking the product. As the number of dots per inch increases, the dots appear to fuse together to form a continuous whole.

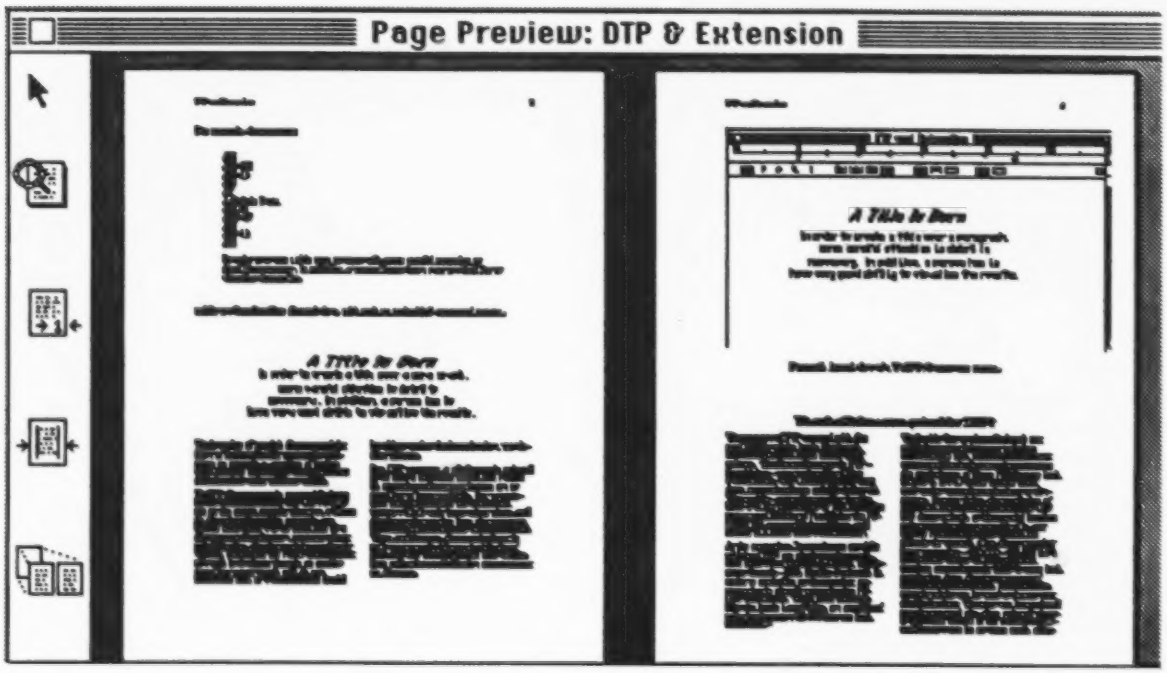

FIGURE 2. Although text is reduced to illegibility, it is still possible to get an overview of the layout of the page. This figure was produced on a word processing program, rather than on a true DTP program, but the effect is similar.

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The superior ability of the Macintosh system to produce high-definition screen images, coupled with the capability to use a mouse[4] to manipulate elements on the screen, gives that system the edge for DTP applications, however, and appears to be the choice configuration for most graphic arts departments and firms moving into DTP. What is perhaps the major disadvantage of the Macintosh system, its relatively small screen, can now be circumvented by adding a separate full-page-sized monitor (available from several firms), albeit at considerable additional cost.

[4] A mouse is a cigarette-pack sized (the pouch pack) box which is rolled over the top of the desk, thereby manipulating a pointer on the screen.

What are some phenomena related to DTP?

The introduction of DTP has brought along with it a series of phenomena, some of which are good, some of which are not so good, and some of which are merely amusing or irksome. Listed below are several I thought deserved special identification and comment; they are not in any particular order, nor is the list exhaustive.

- ***The potential for pretty-looking, but poor quality or unnecessary publications***

In statistics, there is a maxim known as the Law of the Hammer, which states, in essence, that if you give a four-year-old a hammer, suddenly everything in his or her environment needs hammering. Originally coined to describe the proclivity of graduate students to suddenly begin performing a particular type of statistical analysis on every set of data within reach, immediately after learning the technique, it can equally be applied to DTP in education and in business and industry. With the availability of the capability to produce professional-looking print quickly, easily, and relatively inexpensively, there has been a plethora of newsletters and periodicals springing on the scene. Some of these are excellent, but some of them are simply bad publications that are printed prettily. Until recently, the print quality of a publication was usually a reasonably good guide to its overall quality: If someone took the time and expense to have something printed attractively, it was usually an indication that the same type of care had been lavished on the content of the publication. Unfortunately, that can no longer be assumed.

Even if the quality of content is high, there may be other reasons (usually having to do with size of market) not to publish a given work. As extension units' clients come to believe in the much touted "ease and low cost" of DTP, they will either create their own little vanity presses, or apply pressure to extension units to do so. A case in point is a recent highly insistent

claim from a history professor that a reprint and translation of an old French text on astronomy could (and therefore, presumably, *should*) be published "at a very modest cost" using the "new technology of desktop publishing."

It will take us a while to learn how to use these powerful new tools appropriately.

• *Increased use of graphics for communication*

One longer-term consequence of the availability of DTP, in my estimation, is that people can and will begin to depend more heavily on the use of graphics for communication. Whereas it used to require either some native ability or acquired skill, some more-or-less specialized drawing tools, and considerable time (or the economic equivalent of those things) to produce even a simple graph or line drawing, now almost anyone equipped with a microcomputer and suitable programs can quickly and easily create high-quality graphics.

Now almost anyone can be an artist—sort of! Computer programs such as MacPaint, FullPaint, MacDraw, and MacDraft, among others (the list changes daily) give even those who are "all thumbs" the ability to draw simple graphics quickly, easily, and with a very short learning time. Dozens of shapes, lines, and patterns are available, each at the click of a button. Text can be intermixed with these graphic elements, and errors "erased" with another click of a button. Elements (either graphic or text) can be re-positioned on the page simply by pointing at them with the mouse, and dragging them into their new positions. Elements can be enlarged or reduced, rotated, flipped, or distorted just as easily to achieve the desired effect.

Furthermore, there are commercially available libraries of clip-art (copyright-free line drawings intended for use by graphic artists who want to save time, or by those without the skills required to produce them). Digitized images of a wide variety of things can simply be cut out of the library (electronically) and pasted into place (again, electronically) in the document being created. Electronic versions of institutional or company logos can also be created, and simply pasted into place in a document.

Graphs have heretofore been quite expensive to produce. Now that little more than typing in the numbers and making a selection from a menu is required to produce professional-quality graphs, complete with labels and choice of shading, one can expect to see more of them showing up in even non-technical documents.

Just as the advent of the word processor is having a powerful effect on people's abilities to write, so will the emergence of DTP likely have a similar effect on people's abilities to employ various graphic devices to communicate more effectively.

• *Increased awareness of the importance of page layout*

Page layout and the use of white space will begin to assume increasing importance as graphic elements. Everyone who writes will begin to appreciate that the way elements—text and graphics alike—are arranged on a page contributes to or detracts from effective communication. Just as writers now must be aware of the syntax and grammar of language, they will have to become aware of the

syntax and grammar of visual elements, in order to arrange their messages for greatest effect. The standard double-spaced typewritten text, with only capital letters or underlining to add emphasis and direct attention, will gradually give way to more polished page design. Headlines, multiple columns, and various graphic embellishments will come into common use, hopefully with purpose and forethought.

We can expect some lag time before page layout as a communication tool creeps into the public consciousness, but already there are signs of it doing so. Articles on the topic are beginning to appear in the popular press (e.g., see Spiegelman, 1987), and at least one magazine (*Publish!*) is devoted entirely to that subject.

We can also expect a lag before efficient methods of using the technology become wide-spread habit. For example, it is interesting to note that Spiegelman (1987) recommends drawing thumbnail sketches on tracing paper in order to experiment with different page layouts prior to composing the page on a DTP system. Thus she completely ignores the power of the electronic medium in accomplishing the task, and reverts to doing things the way she was trained to– on paper– bringing the technology into play only at the last moment! Those of us who have struggled through the process of learning to compose and edit text on the screen, rather than doing it on paper and subsequently transferring it to the screen, can no doubt identify with her problem.

• System to system compatibility

In the past, it has been as true in DTP as it has in word processing, spreadsheets, and databases that documents created on one type of system could not be transferred to another system. Specifically, Macintosh documents could not be moved onto PC-DOS (i.e., IBM-compatible) computers and vice versa. Recently, however, there is a strong move among software companies to produce programs that will permit such system to system transfers. From the user's point of view, this move is to be welcomed, as it will provide increased flexibility and permit the exchange of documents heretofore impossible.

• The quality of print materials used in instruction

Recently, some research efforts have been made to investigate various rules of thumb of the printing industry as they affect the quality of learning– and some surprises have emerged. One of the most interesting, in my opinion, is that one of the characteristics of "professional-looking" printing– the right justified margin– is actually counter-productive. Right-justified text, by varying the space between words and requiring the insertion of hyphens, actually impairs legibility (Hartley & Burnhill, 1977; Hartley, 1978). Just as the availability of computers is becoming more widespread, permitting right-justification to be done conveniently and easily, we find out it's not a good thing to do! It will be an uphill battle to convince educators, though. Typically, novices to word processing and DTP will insist on making right margins justified, even on their memos and letters, just because it "looks more professional".

On the other hand, the ability to mix graphics with text easily is likely to be a boon to educators. No longer need diagrams and graphs be omitted

because they are too difficult or expensive to include in a document. Similarly, bold face and italic printing, in varying sizes, can easily be used to create headlines and section titles. Hopefully, educators will pay attention to the growing body of literature on how to use text elements effectively, rather than simply using these capabilities willy-nilly. Some particularly appropriate information can be found in Jonassen (1982), Hartley & Burnhill (1977), and Hartley (1978). Similar guides exist for graphics (Merrill & Bunderson, 1981; Jonassen, 1982; Levie & Lentz, 1982).

What extension functions are likely to be affected by DTP?

It is not always the case that a product gets used in the way it was intended, and predictions about the uses of computers can be wildly inaccurate. Nevertheless, I would like to speculate on a few extension functions that seem likely to be affected by the proliferation of DTP.

- ***Word Processing***

First, DTP will likely augment the now-widespread word-processing function. Instructional materials, reports, and publications of various types will likely begin to incorporate more graphics, and will look less like they have been produced on a typewriter and more like they have been typeset, even while requiring less intervention of specialists in the graphic arts and printing trades.

Overhead projection transparencies can be made quickly and easily (through xerography), in type that is legible and large enough to be read easily from the screen—and again, graphics are easily incorporated with text.

Forms of various kinds (including questionnaires) can be made to look professional, using fonts suitable for the purpose at hand, rather than being constrained to one type size and style, without the considerable cost of typesetting.

- ***Advertising***

Advertising brochures and camera-ready copy for newspaper and journal advertisements and announcements will no longer be either "quick and dirty" typewriter jobs or those requiring professional attention from a graphic arts specialist. A third category, brochures and advertisements created by a programmer or a secretary using DTP methods, will evolve. (Careful examination of advertisements in your local newspaper and some magazines— notably computer magazines—will show that some of them are currently being produced on the same equipment as is used in DTP.)

- ***Bulletins, Fact-sheets, and Newsletters***

Bulletins, fact-sheets, and newsletters will begin to assume a more professional look while requiring less attention from specially-trained people. Some editors are finding that there are virtues in a dynamic editing-layout process, now that it can be accomplished without the editor having to acquire skills previously

found only in layout artists and typographers and without having to tolerate deadline-threatening delays while various other production specialists do their jobs. Journals, monographs, and even books which might formerly have had prohibitively expensive typesetting costs can now be contemplated as "in-house" projects.

• ***Distance Education (Print) Materials***

Distance education materials can be brought to camera-ready form with relatively few graphic arts skills. Changes in course content or the change of a textbook edition that inevitably require the revision of course materials can be accommodated relatively painlessly, without the necessity of re-doing paste-ups whenever a segment of text is inserted or deleted. With the ability to produce professional-looking materials xerographically, the requirement of large print runs to keep unit costs reasonable becomes less important, and press runs suitable to annual enrollment can be made, lessening storage costs.

• ***Signs***

Even something as mundane as a sign placed on the door of the room where a workshop is being held can be made to look impressive, at very little cost, by printing large type through a laser printer. Type as large as 127 point (approximately 1 3/4") can be produced as easily as more typical sizes. The days of dry-transfer lettering seem numbered, and "quick and dirty" hand lettering (with felt pen on newsprint) will soon begin to look unacceptably sloppy.

Are the effects of DTP positive or negative?

Some of the effects of DTP are clearly for the good, others are likely to be construed as negative, at least by some people, and still others are a mixed blessing.

• ***Empowerment***

One important effect of DTP is that of empowerment. Just as the invention of moveable type brought the power to become educated to a hither-to disenfranchised populace, so will ready availability of DTP bring a similar empowerment in terms of the ability to produce graphics and high-quality type. In other words, it used to be that the preparation of a publication using typeset print and (especially) graphics required expensive, special expertise. The power to cause the preparation of such publications, then, was limited to a relative few. DTP is changing that. Although DTP is still not cheap, the relative cost of preparing high quality originals has dropped considerably over the past few years, giving a great many individuals and organizations that capacity, and the prospects seem good for still lower costs in the future.

Clearly, this empowerment is a good thing for people, just as the mass availability of printing with moveable type was. As noted earlier, one of the consequences of empowerment is likely to be a growth in the general

level of ability to communicate graphically. At the same time, there was an allusion earlier to one potential concomitant effect that is somewhat less than desirable– the likelihood that during the time that the general population is learning how to use this new (more graphic) form of communication more effectively, lots of ugly and ineffective print materials will be produced.

• ***Effects on graphic artists and graphic designers***

DTP can be expected to produce one of two polar reactions amongst graphic artists, designers, and editors: love or hate.

Initially, one might expect to find negative reactions to DTP from graphic artists. A typical reaction might be the over-dramatization of the problems created by ugly and ineffective communications prepared by laypeople unversed in the principles of graphic communication. A common reaction of graphic artists is to note what the DTP environment cannot do, rather than focussing on what it permits the layperson to do that could not be done before.

These are not unexpected reactions from a subgroup that feels threatened by technology. Just as typesetters felt the pressure a couple of decades ago when computers began to infiltrate their craft, so graphic designers will begin to feel a loss of prestige and opportunity, in a manner little different from that of the buggy-whip manufacturers at the time of the introduction of the automobile.

The wise ones, however, rather than feeling threatened, will seize the opportunities created by the new technology to become more productive with little or no sacrifice in quality of professional life. Much educating of the general populace in the principles of graphic design and typography needs to be done, and graphic designers are in the best position to do it.

A similar negative reaction from secretaries a few years ago, when word processing was just being introduced into the office environment, flared up, then died a natural death, as secretaries realized that it was indeed a boon not to have to re-type for the third time those reports their bosses were writing. Rather than replacing secretaries, technology has, by and large, simply changed their roles, and the same outcome is likely for graphic artists.

On the other hand, some graphic artists and designers have taken to the technology with alacrity and enthusiasm. The fact that a number of international graphic arts organizations (often associated with newspaper syndicates) have adopted DTP technology on a large scale indicates that some graphic artists and designers feel that the increased efficiency and reduced cost of DTP-produced graphics make its use worthwhile.

• ***Effects on organizational visual image***

There is one aspect to the phenomenon that will challenge administrators and graphic artists together: How does an organization go about developing and maintaining a consistent organizational visual image, now that empowerment is widespread. In the "good old days" (i.e., two or three years ago), artwork prepared within the organization for public consumption was, by virtue of its calling on specialized skills, likely to be done or at least coordinated by

an in-house graphic arts individual or department, which could, through its involvement, sustain a consistent visual image throughout its products. (This consistency might be as simple as ensuring that every newspaper advertisement carries the organization's logo, or that all reports or advertising brochures be of identical – or at least visually consistent– format.)

Now that many, if not all, employees of an organization are becoming visually empowered, the situation is changing markedly, and a degeneration of organizational visual image can be predicted to coincide with the rise of visual empowerment. Knee-jerk reactions placing graphic artists into the role of gate-keeper, approving or rejecting all other employees' products that contain visual representations, are likely to be as ineffective as suggesting that everything employees write must be subjected to the scrutiny of an editor. More creative methods of administering a consistent visual image for an organization are going to have to be invented to cope with this problem.

• Technical quality of printed products

There is no doubt that the technical quality of the printed word now available to the layperson has increased manyfold from that of a few years ago. Still, for many applications, the 300-dots-per-inch (dpi) resolution that DTP systems are capable of is simply not enough.

The question of technical quality cannot be divorced entirely from that of cost. As already noted, devices now exist that can take standard DTP output and print it on photographic paper with resolutions in the 2500 dpi range, but they are very expensive. Still, if resolutions of that magnitude are necessary, they are available. At the same time, the price of 300 dpi laser printers has fallen considerably since their introduction just a couple of years ago, and now that several manufacturers are producing printers capable of interpreting the PostScript language, further price reductions can be anticipated. This, of course, means that they will become more widespread, and the average technical quality of printed materials will rise.

• Publishing is not the same as printing

In a sense, the term 'desktop publishing' is a misnomer: the term 'desktop printing' more accurately describes the capability. The point is, there is a good deal more to publishing than printing the product in an attractive-looking font with good technical quality. As already noted, editing and visual design skills are required. Just as word processing has assisted editing, DTP processes are assisting layout and page composition. The machines can speed the process by making revisions easier, but they cannot replace the human thought processes required for design. Bad editing or layout will still look bad even if done on DTP processes (although, perhaps, somewhat less so). Quality control must continue to be a concern for publishers, whether they be the desktop variety or not.

Inputting text, binding, distribution, and marketing also form part of publishing, and DTP technology does nothing to reduce costs associated with these functions. DTP really deals only with producing the original copy.

It should also be recognized that the

advent of DTP has essentially shifted the locus of responsibility (and thus, cost) from the printer to the publisher, in many cases. It is true that DTP technology can lead to apparently reduced printing costs through the in-house production of camera-ready copy, but the cost of preparing that camera-ready copy is still a real one, regardless of who does it.

• ***The learning curve and the potential for mis-application***

DTP, like any technology, requires a certain amount of learning before it can be used efficiently and effectively. Administrators are going to have to be vigilant to ensure that their employees do not spend considerable amounts of time acquiring skills that they do not really *need* to do their jobs well, but nevertheless *want* to acquire, just because they are current and popular.

At the same time, as already noted, computers do not always get used only for the purposes for which they were intended. You may already know that early in the history of computers a market forecast concluded that the United States "might" have need of as many as nine computers eventually (Adams & Haden, p. 42). We all know how wrong that projection was! The most important reason for the error was that the people making the projections could not foresee the variety of uses to which the computer is eventually being put. It may very well be that employees will find new, unimagined applications within an organization for DTP processes, and this possibility argues in favor of investing employees' time and energy in learning them.

By the same token, computers can't cure stupidity or bad judgement. Just because a job *can* be done by computer is not in itself sufficient reason that it *should* be done. Each potential task must be examined in terms of both possibility and necessity, because the temptation offered by the "hammer" is strong.

Administrators will have to use shrewd judgement to determine which combinations of employees and DTP capabilities will have the highest payoff for their organizations; furthermore, they will have to expect to have a few experiments fail, all in the name of progress.

Some jobs are still best done "the old way"– cutting and pasting bits of paper– especially if they are one-time efforts. Whenever there is likely to be repetition, changing content while retaining format, however, DTP is likely to save time and money.

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Merrill, P. F., & Bunderson, C. V. (1981). Preliminary guidelines for employing graphics in instruction. *Journal of Instructional Development, 4*(4), 2-9.

Levie, W. H., & Lentz, R. (1982). Effects of text illustrations: A review of research. *Educational Communications and Technology Journal, 30*(4), 195-232.

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Hartley, J., & Burnhill, P. (1977). Fifty guidelines for improving instructional text. *Programmed Learning and Educational Technology, 14*, 65-73.

Jonassen, D. H. (Ed.) (1982). *The technology of text: Principles for structuring, designing, and displaying text*. Englewood Cliffs, NJ: Educational Technology Publications.

Speigelman, M. (1987). Interior design for documents. *PCWorld, 5*(2)[March], 178-185.

Appendix

Additional Readings on DTP

The following articles should be useful for orienting the novice to the area of desktop publishing. Although most of these references are quite recent, the area of desktop publishing—like computing in general—is changing daily; thus the older the article, the less credence should be given to descriptions of hardware and software capabilities.

The list below is not necessarily either comprehensive or complete. It is intended only as an entry point to the literature.

Alsop, S. (1987). Desktop publishing without hype. *PC Magazine*, *6*(3) [February], 110-115.

Biedny, D., & Berman, I. S. (1986a). The business of desktop publishing. *MacUser* Special Supplement: *Desktop Publishing on the Mac*, *1*(9) [June], 13-17.

Biedny, D., & Berman, I. S. (1986b). Desktop publishing directory. *MacUser* Special Supplement: *Desktop Publishing on the Mac*, *1*(9) [June], 30-31.

Bobker, S. (1986). The ABC's of desktop publishing. *MacUser* Special Supplement: *Desktop Publishing on the Mac*, *1*(9) [June], 2-5.

Burns, D., & Venit, S. (1987a). Muscling in on the Mac. *PC Magazine*, *6*(3) [February], 119-156.

Burns, D., & Venit, S. (1987b). Stacking up to the Mac. *PC Magazine*, *6*(3) [February], 159-173.

Coffman, R. (1986). The scoop on newsletters. *MacUser* Special Supplement: *Desktop Publishing on the Mac*, *1*(9) [June], 7-10.

Jantz, R. (1985). Proficient pagemaking. *Macworld*, *3*(9) [August], 116-119.

Onosko, T. (1986a). On your Macs.... *MacUser*, *1*(7) [April], 69-73.

Onosko, T. (1986b). You're my type. *MacUser* Special Supplement: *Desktop Publishing on the Mac*, *1*(9) [June], 18-24.

Robertson, B. (1985). Page making on your micro. *Popular Computing*, November, 60-62, 134, 137.

Russell, P. C. (1986). Bringing PageMaker to life. *MacUser*, *1*(14) [November], 74-78.

Shapiro, E. (1987). Personally designed. *MacUser*, *3*(6) [June], 90-96.

Simonsen, R. (1985). Micro-based desktop publishing. *Popular Computing*, [November] 56-59, 129-130.

Steinke, S. (1987). DTP comes to DOS. *Computerland Magazine*, *2(3)* [March/April], 50-59, 67.

DTP Software

The following software list and descriptions are, like the references listed previously, not necessarily comprehensive or complete. New products emerge every week, and occasionally a product is withdrawn from the market. No endorsement is implied of products listed, nor is disapproval intended by omission.

The software below is all Macintosh-based. As noted in the body of this paper, analogs to the products below are emerging very rapidly for the PC-DOS market.

Prices, unless otherwise noted, are list prices, in U.S. dollars. In many cases, the prices available from U.S. software mail-order discounters are appreciably lower than list prices. Canadian prices may be considerably different; please contact your local dealer.

Word Processors

The now-familiar functions of word processors have been augmented in many cases, with spelling-checkers, grammar-checkers, outlining, and other enhancements. Some of these functions are available as "add-on" programs for existing word processors. Only those programs claiming to be primarily word processors are listed below.

Just Text. $195. Knowledge Engineering, GPO Box 2139, New York, NY 10116.

Laser Author. $199.95. Firebird Licensees, PO Box 49, Ramsey, NJ 07446.

MacWrite. $125 ($50 CDN Educational price). Apple Canada, 7495 Birchmount Road, Markham, Ont. L3R 5G2.

MindWrite. $125. MindWork Software, PO Box 222280, Carmel, CA 93922.

Word. $195. Microsoft, 16011 NE 36th Way, Redmond, WA 98052-6399.

Word 3.0. $395. Microsoft, 16011 NE 36th Way, Redmond, WA 98052-6399.

Word Handler. $79.95. Advanced Logic Systems, 1283 Reamwood Ave., Sunnyvale, CA 94089.

WriteNow for the Macintosh. $175. T/Maker, 1973 Landings Dr., Mountain View, CA 94043.

Graphics

Graphics are of several types: (numerical) graphs; drafting emulators, general line-drawing programs, 3-D graphics. Programs are beginning to "blend" together in terms of function, and it is sometimes difficult to classify a given program, since it is capable of doing several kinds of graphics generation. Sometimes, a graphics component is added to a program which is intended primarily for another purpose, as in the case where graphs can be drawn with spreadsheet programs.

Furthermore, graphics programs can be described as either bit-mapped or object-oriented. In bit-mapped graphics, a line drawn is "remembered" by the computer as a collection of points forming the line. Thus elements drawn with bit-mapped graphics

progams can be edited, point by point. For example, a circle could have a portion removed to produce a shape like the letter 'C', using a bit-mapped graphics program. In object-oriented graphics programs, by contrast, each element is composed of primitive shapes like lines, arcs, rectangles, circles, etc. While elements can be made larger or smaller, they cannot be edited in the same way as bit-mapped graphics can. Each approach to graphics has its advantages and disadvantages, which is one reason that some programs have recently been made available that do both bit-mapped and object-oriented graphics in the same programs.

Graphing Programs

Chart. $125. Microsoft, 16011 NE 36th Way, Redmond, WA 98052-6399.

Cricket Graph. $195. Cricket Software, 3508 Market St., Philadelphia, PA 19104.

Jazz. $595. Lotus, 55 Cambridge Parkway, Cambridge, MA 02142. (An integrated package capable of performing five different functions, one of which is graphs.)

Excel. $395. Microsoft, 16011 NE 36th Way, Redmond, WA 98052-6399. (Primarily a spread-sheet program, but capable of producing graphs.)

Bit-Mapped Graphics

ComicWorks. $79.95. Mindscape, 3444 Dundee Rd., Northbrook, IL 60062.

FullPaint. $99.95. Ann Arbor Softworks, 308 1/2 State St., Ann Arbor, MI 48104.

GraphicWorks. $79.95. Mindscape, 3444 Dundee Rd., Northbrook, IL 60062.

MacPaint. $125 ($50 CDN Educational price). Apple Canada, 7495 Birchmount Road, Markham, Ont. L3R 5G2.

SuperPaint. $99. Silicon Beach, 9580 Black Mountain Rd., PO Box 261430, San Diego, CA 92126. (Combines bit-mapped and object-oriented graphics.)

Object-Oriented Graphics

Cricket Draw. $295. Cricket Software, 3508 Market St., Philadelphia, PA 19104.

MacDraft. $239. Innovative Data Design, 1975 Willow Pass Rd., Concord, CA 94520.

MacDraw. $195 ($192 CDN Educational price). Apple Canada, 7495 Birchmount Road, Markham, Ont. L3R 5G2.

SuperPaint. $99. Silicon Beach, 9580 Black Mountain Rd., PO Box 261430, San Diego, CA 92126. (Combines bit-mapped and object-oriented graphics.)

3D Graphics

Easy3D. $149. Enabling Technologies, 600 S. Dearborn, Chicago, IL 60605.

MacModel. $40. A.P.P.L.E. Co-op, 290 SW 43rd St., Renton, WA 98055.

Mac3D 2.0. $249.95. Challenger Software, 18350 Kedzie Ave., Homewood, IL 40430.

Phoenix 3D. $39.95. Dreams of the Phoenix, PO Box 10273, Jacksonville, FL 32247.

Page Composition (DTP) Programs

Page composition programs are the "meat" of DTP. They permit the user to manipulate graphic elements on the screen in WYSIWYG form, as described in the body of the paper.

MacPublisher II. $195. Boston Software Publishers, 1260 Boylston St., Boston, MA 02215.

PageMaker. $495. Aldus, 411 Fisrt Avenue South, Seattle, WA 98104.

Ragtime. $395. Orange Micro, 1400 N. Lakeview, Anaheim, CA 92807.

ReadySetGo! 3. $195. Manhattan Graphics, 401 Columbus Ave., Valhalla, NY 10013.

Typical Hardware Required for DTP

The hardware configurations below are Macintosh-based only. Prices given are Canadian, educational prices.

Computer

Either a Macintosh 512E, a Macintosh Plus, or a Macintosh SE may be used for DTP. Although the 512E can be used, its smaller main memory may make DTP processing somewhat slower than one might like. The Plus or the SE is therefore preferable. The SE has the advantage of being capable of housing an internal hard disk, which offers convenient, fast storage of files. Since DTP files tend to be quite large, the hard disk would be an advantage.

Macintosh 512E – $1693.00

Macintosh Plus – $2162.00

Macintosh SE (standard) – $2976.00

Macintosh SE (hard disk) – $3697.00

Printer

The LaserWriter (or equivalent) printer is a necess[illegible] for DTP. A LaserWriter Plus offers a greater selection of fonts and greater speed tha[illegible]e LaserWriter, and is therefore desirable, but not a necessity. It is useful to have a dot matrix printer (an ImageWriter II) for use with applications other than DTP, including standard word processing and for use with drafts of DTP articles.

ImageWriter II – $597.00

LaserWriter – $4928.00

LaserWriter Plus – $5617.00

Sample DTP Materials

Pages A-1 to A-6 are actual "first effort" products produced at the University of Saskatchewan with PageMaker on a Macintosh Plus, and printed on a LaserWriter Plus.

The first two pages show the first and second page proofs of part of a document. Changes that were made include adjusting the round-cornered rectangular borders on the top half of the page to fit better around the text, fixing the typographical error in the date at the lower left, and re-writing the segment in the rectangle at upper right. The time to change the first version into a finished second version was about 10-15 minutes, with all work done by the editor, on the screen. The re-write was done right within the DTP program, so that the editor could immediately see the effect of changes in wording.

Pages A-3 and A-4 show portions of a fact-sheet produced with the same DTP system. In this instance, since the editor was still learning how to use the system, he chose to physically paste in the drawings, but they too could have been produced with the Macintosh. The rectangular outlines surrounding the drawings were created on the screen with PageMaker. The original was printed on the LaserWriter, then the drawings were simply pasted into place, and quantities of the document were printed. All text (with the exception of the masthead, which could have been been done with PageMaker, but had already been prepared by the printer in this instance) was put into place right on the screen.

Pages A-5 and A-6 are examples of some printed distance education materials produced at the U of S. Page A-5 illustrates the ease with which visual images can be incorporated into the text. Since the images are digitized, revisions to the text surrounding the graphics can be revised as necessary without the need for pasting up the graphics. The visage of Karl Marx was digitized from an illustration in a textbook, then reduced; the folder and page graphic was drawn directly on the Macintosh. Page A-6 illustrates the use of icons (designed at the U of S) to designate certain learner activities. The icons are inserted into the text as characters of a special font.

Pages A-7 and A-8 are samples of simple signs produced with a word processing program. It took approximately four minutes to produce the first sign, including drawing the arrow from "scratch"– a job that will not have to be re-done, since the arrow has now been saved as a graphic element, and can be pasted into place wherever it is needed. (While I was at it, I rotated the original arrow to make three similar arrows, pointing in each of the other directions, for future use– a job that took about 60-70 seconds.) By simply substituting a new set of words for the old, using the now-familiar power of the word processor, the second sign took less than 30 seconds to produce.

Finally, the two drawings of automobiles on pages A-9 and A-10 are included merely to illustrate the quality of graphics that can be produced on a Macintosh. They were not produced at the U of S.

The triptych brochure distributed separately was prepared on PageMaker, using a template document. Whenever a new brochure with the same format (but different content) is needed, the template is simply "filled" with new words; the formatting is automatic. Again, all work is done on the screen, and no pasting up of bits of paper is required.

Times Changing,cont.

number of farmers are living on the knife edge these days, with a very cloudy financial future. Many wonder if this is their last year on the farm. Extension agents also face uncertain times. Most have faced re-organization, "downsizing," or some change in their careers lately.

Our organization, CSE, is also in transition. Over the next two years CSE may change significantly, along with AIC. The future holds a great deal of uncertainty for our organization. We may relate to AIC in a much different way in two years' time. Our membership may change drastically. Such changes can be unsettling and difficult to deal with. Extension workers are often referred to as "change agents." In the future we will have to use all our professional abilities as change agents in our jobs and our professional organizations to bring in change smoothly and correctly. Our ability to communicate with our clients and our colleagues will become our biggest asset. We must use this skill wisely to help shape a better future.

It is time to begin creating this future. We must step forward now and take advantage of the opportunities that may emerge. Please express your opinions on AIC restructuring and CSE's place in AIC to the board members. We need ideas, opinions and direction in order to determine the future.●

Desktop Publishing, cont.

Pagemaker software to lay out the publication on the computer screen. Finally, we ran the publication on our laser printer and sent it "camera-ready" to Ottawa for printing.

The wonder of this new technology is that is allows us to prepare publications "camera-ready" ourselves, whereas in the past typesetting and layout were done at the print shop — a time-consuming, expensive and often frustrating procedure. The new pagemaking software also gives us more scope for creativity in our layouts, since the design of the pages can be changed easily and quickly.●

EVALUATION: HAVE OUR PROGRAMS MADE AN IMPACT?

Glen Werner, P.Ag., District Agriculturist, Stettler, Alberta

Glen's article gives the highlights of a presentation by Dr. William Rivera, Professor of Adult Education at the University of Maryland. Dr. Rivera was speaking at a seminar in Edmonton in November, 1988. The so-Called "Program Evaluation in Adult Education," the seminar was sponsored by Alberta Agriculture, the Faculty of Extension of the University of Alberta, and the Canadian Society of Extension.

Adult educational programs are now under the sharp scrutiny of policy makers and administrators. Program efficiency is being measured in hard economic terms such as cost-benefit ratios. The current question being asked is: "What is the impact or long-range effect of this specific activity or program?"

Dr. W. M. Rivera reminds us that in this current environment of reassessment governments and institutions have placed major emphasis on "impact" studies. The pressure is stronger than ever to "prove" program effectiveness and usefulness by performance testing and practice surveys, and even more so by way of direct studies of "impact," or end result.

In the past, extension educators have often been so involved in needs assessment, program planning, and design and implementation that little time remained for program evaluation. The times have changed. Now evaluation must be very much a part of the total education program development. Evaluation can have three major purposes:

1) It can be useful to the program presenter by helping improve the presentation. Evaluation asks if knowledge and attitude changes have taken place. It also observes if there are changes in the skills and aspirations of the learners.

2) Evaluation can determine if the program objectives were met. Did a practice change result from the program, and has there been a long-range impact as a result of the program?

Times Changing,cont.

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Desktop Publishing, cont.

Pagemaker software to lay out the publication on the computer screen. Finally, we ran the publication on our laser printer and sent it "camera-ready" to Ottawa for printing.

We invite you to send us: articles about programs, activities and research; material for our up-coming "People" columns, which will report on the activities and achievements of our members; and notes on new publications. Please submit material for the Spring issue of *EIB* by May 15.

Co-editors: Bruce Hobin (P.Ag) and Bert Wolfe, Extension Specialists, Division of Extension, University of Saskatchewan, Saskatoon S7N 0W0.●

EVALUATION: HAVE OUR PROGRAMS MADE AN IMPACT?

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PRUNING

PUBLISHED BY THE DIVISION OF EXTENSION AND COMMUNITY RELATIONS APRIL 1987, PUBL. 553

PRUNING

S. H. Nelson and C. Stushnoff
Department of Horticulture Science

GENERAL CONSIDERATIONS

Timing

In the Prairie provinces pruning is best done in late winter and early spring. Most homeowners will have very little pruning to do, so they can afford to wait for a mild, sunny spring day when it is a pleasure to get outdoors. In a few cases, pruning is carried out at other times; these situations will be discussed later.

Types of Cuts

There are 2 types of cuts that can be made on any particular tree. One is known as a **heading cut** (Fig. 1a). It is made anywhere on a twig between 2 nodes or on branches or limbs. The second type of cut is the **removal cut** (Fig. 1b); it is made to remove an entire twig, branch, or limb right back to its origin.

The heading cut is made to deliberately stimulate dormant buds below the cut to break and develop new branches. This type of cut is made when shearing a hedge so that new buds below the shearing action will develop and produce a full, thick hedge effect. The purpose of the removal cut is to deliberately remove a twig, such as a water sprout in an apple, without inducing further bud growth or bud break. In this case, the cut thins out and allows the penetration of more light into the tree or shrub.

In deciding which type of cut to use, keep in mind the overall purpose of the specific pruning task. For example, the purpose of pruning a hedge is to maintain full foliage and encourage bud breaks below the cut; therefore, heading cuts are recommended. At the other extreme is the pruning of a mature apple tree, where excessive growth has produced too much shading and, as a result, the fruit has deteriorated in terms of size and number. In this case, removal cuts are recommended because the purpose of pruning is to remove a few branches. This will allow more light to penetrate and produce good-quality fruit.

Careful Cutting

Remember to make the cuts flush with the trunk so that no stubs remain. If pruning shears are held the wrong way, a stub will always remain. It is important to hold the flat part of the pruning shears flush with the trunk or branch where the cut is being made.

Pruning often involves cutting relatively large, heavy branches. If the saw cut is started on the upper side of the branch, the wood below the saw cut will often break because of the weight of the branch. The broken branch is likely to pull off a long strip of bark down the trunk. To avoid this, begin the saw cut on the *underside* of the branch, and cut until the saw just starts to bind (Fig. 2a). Next make a saw cut a little farther out and on the *upperside* of the branch, and saw downward until the branch breaks off (Fig. 2b and 2c). Then a smooth, clean cut can be made to remove the stub (Fig. 2d and 2e). Note that there is a natural collar where

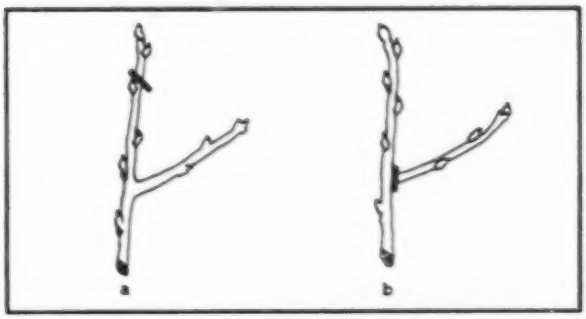


Figure 1 — (a) Heading cut; (b) Removal cut.

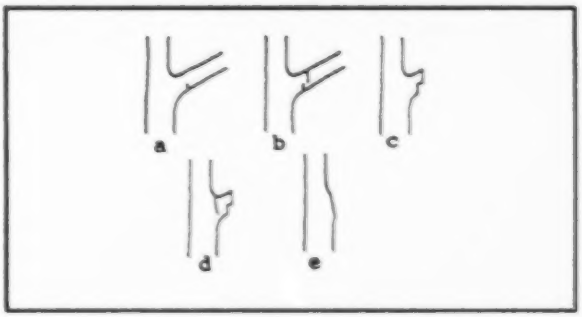


Figure 2 — Pruning of a large branch.

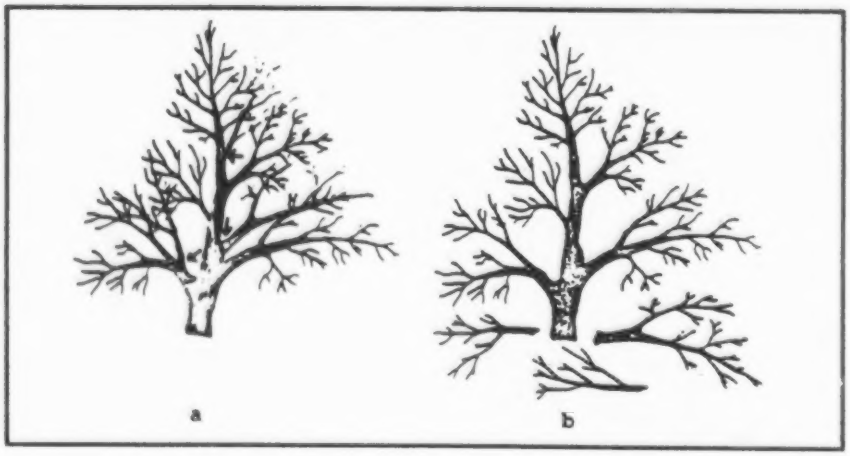


Figure 5 — A tree thinned with 3 major cuts.

large stubs that will produce many adventitious buds. The result will be a "witches' broom" growth that will spoil the natural shape of the tree.

If heading back is necessary, first examine the tree. There will be a number of ascending branches that reach about the desired height. These branches can be left. Simply remove the offending portions of the tree at the point of origin. As shown in Fig. 6, this method retains the general shape of the tree. In Fig. 6a, 3 cuts are made as indicated by the arrows. The branches removed are shown in Fig. 6b, and the tree after pruning appears in Fig. 6c.

This selective pruning approach takes less time and requires fewer pruning cuts than the "brush cut" method so often practiced. Even more important, there is no proliferation of adventitious buds; only a small number of branches are cut, and the remaining branches are left to grow normally.

Side Branches — A similar approach can be taken to prune side branches. Select a secondary branch growing roughly in the same direction as the offending branch. Then, as shown in Fig. 7, remove the offending portion back to the secondary branch.

Pruning After Root Injury

Trees are commonly pruned because branches interfere with telephone and power lines or obstruct driveway and sidewalk traffic. Pruning should also be considered when the root system of the tree is disturbed or injured — for example, by sidewalk, driveway or foundation construction or by moving activities. A tree with injured roots will not support its entire top growth, and die-back will occur. If pruning is not carried out, twigs and branches will die and have to be removed. Because the die-back occurs in a random way, the natural shape of the tree might be distorted. It is advisable to selectively head back or thin trees with injured roots to avoid random die-back of top growth.

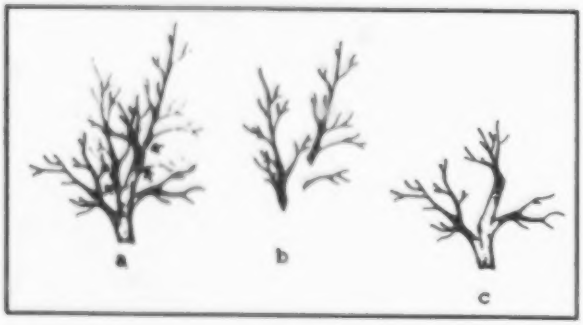


Figure 6 — Heading back of trees.

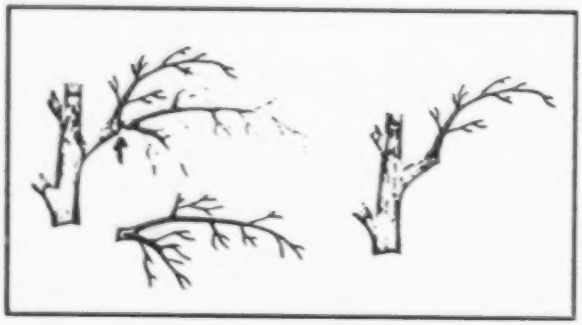


Figure 7 — Heading back from the side.

procedures as their major tools in the service of existing bureaucracies and power centres.

To me, the major task of social science is to abstract from the confused flow of events perspectives which clarify and which permit some judgment about a society in the light of moral principles.[8]

Conflict Tradition

"The materialist doctrine that men are products of circumstances and upbringing, and that, therefore changed men are products of other circumstances and changed upbringing, forgets that it is men who change circumstances ...

"The philosophers have only **interpreted** the world in various ways; the point, however, is to **change** it."[9]

WORKSHEET

VALUE NEUTRALITY

VALUE COMMITMENT

Above is a treasure trove of opinions and arguments concerning these two concepts.

[8]Grayson, J. Paul, (ed.) (1983) Introduction to Sociology Toronto: Gage, pg.31.
[9]Tucker, Robert C. (ed.) (1978) The Marx-Engels Reader New York: W.W. Norton and Co. Inc. pp 144-5.

SECTION C: LEARNER DECISION MAKING

Section Objectives:

When you have completed this section, you should:

1-6. Know why people participate in educational events.

1-7. Know ways to determine learner goals.

Learning Activities:

Learner Decision Making (Course Guide)

Complete EXERCISE X1-7 (to be retained and used for the major assignment)

Complete EXERCISE X1-8 and X1-9 (to be mailed in upon completion of this module)

Refer back to the SECTION OBJECTIVES and be sure you can meet them

Learner Decision Making

People give a wide range of reasons for their participation in educational activities. Table 1 lists the results of a survey that asked people who were considering becoming involved in group educational activities how important the various reasons were; and asked people who were already participating why they were.

The important thing to note in this information is that not all people participate in learning because of the knowledge they will gain. You may have people attending your courses who are there to achieve social goals or to escape boredom. The list included in the table represents nine motivational factors: desire to know, desire to reach a personal goal, desire to reach a social goal, desire to reach a religious goal, desire to escape, desire to take part in a social activity, desire to comply with formal requirements, desire for personal fulfillment and desire for cultural knowledge. Two general reasons dominate: personal growth and fulfillment—become better informed, satisfy curiosity, be better parent; and practical concerns—advance in job or get a new job, satisfy employer.

Decisions about whether to learn something, then what to learn, are made outside the teaching/learning situation. They are made by the learner on his/her own or in consultation with an employer, a family member, a counsellor. They are made based on a combination of the learner's understanding of his/her goals, and of the learner's knowledge of available educational opportunities and how they contribute to his/her goal achievement. Information about educational opportunities provided in calendars, publicity, brochures and advertisements released by educational institutions therefore play a part in establishing the teaching/learning environment. From it, plus the learner's general knowledge about the institution or organization offering the educational program, the learner develops the expectations he/she brings to the program's first session.

Introduction To Desktop Publishing

Room 36

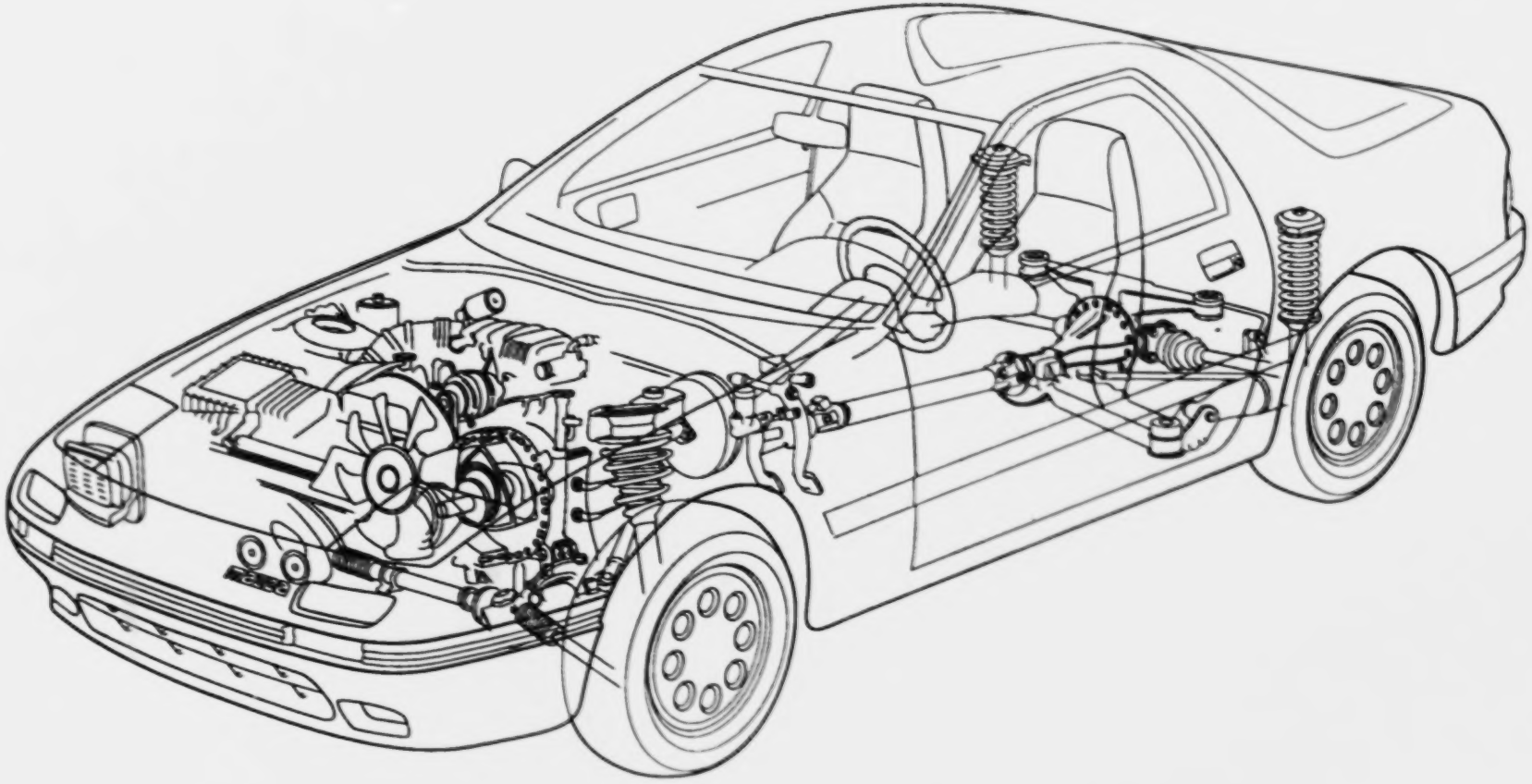
Geriatric Nursing

Room 19

30

31

A-8



32

33

A-9